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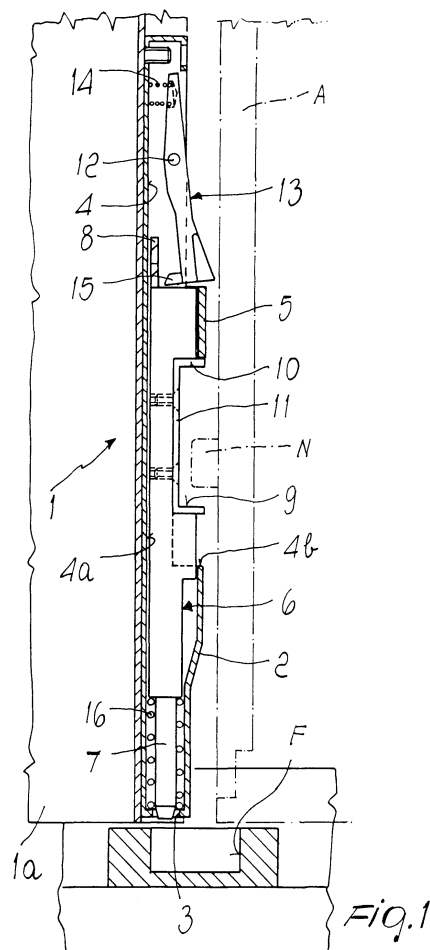
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(54) **Automatic locking device for door or window wings**

(57) An automatic-release device for closing door or window wings and the like, comprising a locking bolt (7) which is slideable inside an enclosure (2) which is fixed in the stile of the sash of the wing and is insertable in a slot (F) formed in the corresponding rail of the window, elastic means (16) for retracting the bolt (7) from the slot (F) and manually-actuated retention means (13) which are accommodated in a seat (4) of the enclosure (2) and are suitable to retain the bolt (7) in a position for insertion in the slot (F) and to allow its disengagement from the slot by means of the elastic retraction means (16).



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Description

[0001] The present invention relates to an automatic-release device for closing door or window wings and the like.

[0002] Windows or doors with two wings are often provided with retractable bolts which allow to lock the fixed wing which is not provided with a handle, so as to provide an abutment for the closure of the movable wing.

[0003] In conventional devices, the two wing locking bolts must be inserted and extracted by means of sliding or lever mechanisms which are very difficult to operate, since they require pushing or pulling forcefully small grips or cavities. Moreover, these devices are located proximate to the end of the wing and are therefore often located too high or too low for easy access.

[0004] The aim of the present invention is to obviate the above-cited drawbacks of conventional devices, i. e., to provide an automatic-release device for closing door or window wings and the like which can be operated simply and accessed comfortably.

[0005] Within the scope of this aim, an object of the present invention is to provide a device which is simple, relatively easy to provide in practice, safe in use, effective in operation and of relatively low cost.

[0006] This aim, this object and others which will become apparent hereinafter are achieved by the present automatic-release device for closing door or window wings and the like, characterized in that it comprises a locking bolt which is slideable inside an enclosure which is fixed in the stile of the sash of the wing and is insertable in a slot formed in the corresponding rail of the window, elastic means for retracting said bolt from said slot and manually-actuated retention means which are accommodated in a seat of said enclosure and are adapted to retain said bolt in a position for insertion in said slot and to allow its disengagement from said slot by means of said elastic retraction means.

[0007] Further characteristics and advantages of the present invention will become apparent from the following detailed description of two preferred embodiments thereof, illustrated only by way of non-limitative example in the accompanying drawings, wherein:

Figure 1 is a sectional view of a first embodiment of the invention with the bolt retracted;

Figure 1a is a view of the abutment stile of the movable wing;

Figure 2 is a side sectional view of the invention, with the bolt in the position for retaining the wing in the closed position;

Figure 3 is a sectional front view of the bolt of Figure 2;

Figure 4 is a front view of a second embodiment of the invention;

Figure 5 is a sectional side view of the invention of Figure 4 in the wing release position;

Figure 6 is a sectional side view of the invention of

Figure 4 in a step preceding the position in which the wing is retained closed;

Figure 7 is a sectional side view of the invention of Figure 4, in the position in which the wing is retained closed;

Figure 8 is a sectional side view of the invention of Figure 4 after release has occurred.

[0008] With particular reference to the above figures, the reference numeral 1 generally designates an automatic-release device for closing door or window wings and the like according to the invention.

[0009] The device shown in Figures 1, 2 and 3 is designed to be fitted to the stile 1a of what is usually the fixed wing and acts as an abutment for the movable wing. The device is conceived to be operated by means of a handle-controlled mechanism for opening the movable wing. The device is constituted by a case-shaped outer enclosure 2 which has a rectangular cross-section and is installed in a seat of the lower end of the stile 1a. The enclosure 2 is provided with a lower hole 3 and with a front face which is divided by a partition 5 into two openings through which access is gained to a seat 4 and to a cavity 4a.

[0010] A slider 6 is slideably contained in the enclosure 2 and comprises, at the upper end, a tab 8 which is adjacent to the wall of the enclosure 2 and, at the lower end, a bolt 7 around which a spring 16 is arranged; the spring is locked between the rim of the hole 3 and a shoulder of the slider 6. At the opening 4b, through which access is gained to the cavity 4a, the slider 6 has a rectangular recess which accommodates a U-shaped metallic reinforcement element 10 which is fixed by means of two screws 11 and forms a hollow 9.

[0011] The walls of the seat 4 located above the partition 5 are crossed by a pivot 12 which acts as a fulcrum for a lever 13 for releasing the slider 6 and the bolt 7. The upper end of the lever 13 is pushed outward by a spring 14, while the lower end forms a tooth 15 which is actuated by the spring 14 against the end wall of the enclosure 2. When the slider 6 is in the lowered condition and the bolt 7 protrudes from the hole 3, the tooth 15 interferes with the tab 8 and prevents the slider 6 from rising due to the spring 16, so that the bolt 7 remains in the wing locking position. In order to release the fixed wing, lifting the bolt 7, it is sufficient to press on the upper arm of the lever 13 in contrast with the return action of the spring 14 so as to disengage the tooth 15 from the tab 8 and allow the upward movement of the slider 6 and of the bolt 7. The abutment of the reinforcement 10 against the partition 5 ensures the stroke limit of the slider 6.

[0012] When closing the free wing, a pawl N fitted on the rod A connected to the actuation handle is inserted in the hollow 9, proximate to its lower edge.

[0013] By operating the handle in order to lock the free wing, the pawl N descends, resting on the inner edge of the hollow 9, and pulls down the slider 6, causing, si-

multaneously with the compression of the spring 16, the descent of the bolt 7 into the appropriately provided slot F provided on the lower rail of the window. When the tab 8 has descended below the tooth 15, said tooth, under the thrust of the spring 14, moves into abutment against the end wall of the enclosure 2 so as to prevent said tab and said slider 6 from rising again and keep the bolt engaged in the slot F.

[0014] A second embodiment of the invention, designed in particular to lock the upper end of the fixed wing, is shown in Figures 4 to 8. In this embodiment, the enclosure 2 is provided with an upper opening 3 and with a seat 4 which is open at the front and occupies the lower part of said enclosure. The seat 4 is delimited, in an upward region, by a transverse wall 17 which is provided with a hole 17a in a central region and with a slit 17b adjacent to the internal wall of the enclosure 2. The wall 17 closes, inside the enclosure 2, a cavity 2a which is open upward through the opening 3. A closure bolt 18, of the latch type having a trapezoidal cross-section, can slide vertically in the cavity 2a, protruding from the opening 3, and is flanked by a prism-shaped element 19 which has an identical cross-section and is slightly thicker and can slide independently of the bolt 18 and parallel thereto. A stem 20 is fixed to the internal end of the element 19, passes through the cavity 2a and continues in the seat 4 through the hole 17a.

[0015] The element 19 is meant, as will become apparent hereinafter, to arm the spring meant to retract the bolt 18 from the position for locking in the closed configuration the wing on which it is fitted.

[0016] A tab 21 is driven through the slit 17b and is guided on the stem 20 with a U-shaped portion. The U-shaped portion comprises an end flap 22 and an intermediate flap 23, both of which are crossed by the stem 20 and are connected by a bridge 24 which is parallel to the stem.

[0017] A collar is arranged on the stem 20 in the portion that lies between the flaps 22 and 23 and is constituted by an elastic ring 25 which acts as an abutment for a spring 26 which acts by compression between the ring 25 and the intermediate flap 23 so as to actuate the ring 25 toward the end flap 22.

[0018] A gap remains between the bridge 24 and the front wall of the enclosure 2 and a strip 27 is guided therein and rigidly coupled to the bolt 18 with its upper end. The lower end of the strip 27 is folded at right angles so as to form a flap 28 which lies below the intermediate flap 23 of the tab 21, through which the stem 20 is guided. A spring 29, which is less rigid than the spring 26, is interposed between the flap 28 and the wall 17.

[0019] In order to prevent the stem 20 from leaving the hole 17a and protruding upward by means of the action applied by the springs 26 and 29, at the end of the stem that extends downward in the seat 4 there is a collar which is constituted by an elastic ring 30 for abutment against the wall 17.

[0020] In the inactive position, shown in Figure 5, the

spring 26, by acting on the intermediate flap 23 of the tab 21, keeps the other end flap 22 rested on the ring 25, while the spring 29 acts against the flap 28 of the strip 27 so that said strip, after abutting against the intermediate flap 23, moves the stem 20 upward up to the stroke limit determined by the abutment of the ring 30 against the wall 17.

[0021] In this inactive position, which corresponds to the position in which the wing is open, the bolt 18 and the element 19 protrude from the upper hole 3 with their latch-shaped portion.

[0022] As in the previously described embodiment, the seat 4 is crossed transversely by a pivot 12 which acts as a fulcrum for a lever 13 for releasing the bolt 18. The manner in which the lever 13 cooperates with the strip 14 is similar to the manner already described in relation to the tooth 15 and the tab 8.

[0023] In order to use the device, in the upper horizontal rail of the window there is a slot F at the region where the bolt 18 engages; the dimensions of said slot are such that it can receive only said bolt and leaves the arming element 19 rested against the surface of the rail adjacent to the slot 9. When the wing is open, the bolt 18 and the element 19 protrude from the opening 3 due to the thrust of the spring 29 (see Figure 5). By closing the wing, the bolt 18 and the element 19 strike, by means of the oblique face of their latch-shaped portion, the rail of the window and are actuated to retract into the cavity 2a. In this step (see Figure 6) both springs 26 and 29 are compressed. In particular, the spring 26, due to the retraction of the stem 20, remains compressed against the intermediate flap 23, since the tab 21 is prevented from sliding due to the tooth 15 against which it abuts. When it reaches the slot F (Figure 7), the bolt 18, pushed by the spring 29, enters said slot while the element 19 remains retracted, keeping the spring 26 compressed (see Figure 7). In this configuration, the bolt 18 keeps the wing in the closed position.

[0024] In order to open the wing, the lever 13 is pressed so that the tooth 15 disengages from the tab 21, which now, due to the spring 26, is pushed downward into the seat 4 inside the enclosure 2 (see Figure 8).

[0025] It should be noted that the movement of the tab 21 and therefore the retraction of the element 19 into the cavity 2a is allowed by the fact that the force applied by the spring 26 is greater than the force applied by the spring 29, so that the latter spring is compressed, causing the retraction of the strip 27 and accordingly the disengagement of the bolt 18 from the slot F. At this point the wing is free and can be opened; the bolt 18 and the element 19, after disengaging the slot F, are pushed outward by the spring 29, allowing the lever 13 to rearm for the subsequent engagement of the tooth 15 against the tab 21. The device therefore returns to the initial configuration of Figure 5.

[0026] It has thus been observed that the invention achieves the intended aim and object, and in particular

that it provides an automatic-release closure device for door or window wings which can be actuated by simply pressing on the lever 13.

[0027] The first embodiment of Figures 1 to 3 provides for a variation which allows to lock the slider 6 even if the depth of the slot F is such as to permit only a partial penetration of the bolt 7 in the slot, so that the tooth 15 would be unable to surmount the tab 8 and move into a position for blocking the slider 6, or if the strokes of the pivot N do not correspond to a full rotation of the actuation handle.

[0028] This embodiment consists in providing, on the two sides of the tab 8, a plurality of mutually opposite notches 31 which can be engaged by two teeth 15 of the lever 13.

[0029] In this manner, the two teeth 15 can engage the two notches 31 that correspond to the stroke for inserting the bolt 7 in the slot F and lock the slider 6 at the level that corresponds to said stroke.

[0030] In practice, all the details may be replaced with other technically equivalent ones. Further, the materials employed, as well as the shapes and the dimensions, may be any according to the requirements without thereby abandoning the scope of the protection of the appended claims.

[0031] The disclosures in Italian Utility Model Application No. BO98U000108 from which this application claims priority are incorporated herein by reference.

[0032] Where technical features mentioned in any claim are followed by reference signs, those reference signs have been included for the sole purpose of increasing the intelligibility of the claims and accordingly, such reference signs do not have any limiting effect on the interpretation of each element identified by way of example by such reference signs.

Claims

1. An automatic-release device for closing door or window wings and the like, characterized in that it comprises:
 - a locking bolt which is slideable inside an enclosure which is fixed in the stile of the sash of the wing and is insertable in a slot formed in a corresponding rail of the window;
 - elastic means for retracting said bolt from said slot; and
 - manually-actuated retention means which are accommodated in a seat of said enclosure and are adapted to retain said bolt in a position for insertion in said slot and to allow its disengagement from said slot by means of said elastic retraction means.
2. The device according to claim 1, characterized in that said bolt is cylindrical and rigidly coupled to a

slider which is slideable in said enclosure and is provided with a front hollow which is engageable by a pawl which is rigidly coupled to a manually-operated actuation rod in order to move said bolt into the position for engaging said slot of said rail.

3. The device according to claim 2, characterized in that said elastic means are constituted by a spring which is arranged around said bolt and acts between said bolt and said enclosure, so as to be compressed when the bolt engages in said slot and expand when the slider is released.
4. The device according to claim 1, characterized in that said enclosure forms a seat, a cavity being provided which has an opening and is separated from said seat by a wall located opposite said opening, a bolt and an arming element being guided in said cavity and protruding from said opening, said bolt and said element being shaped like a trapezoidal latch, a stem being rigidly coupled to said element, being guided in a hole of said wall and having an end which extends into said seat, a first collar and a second collar being rigidly coupled to said stem, said first collar being rigidly coupled to said end and being suitable to abut against said wall in order to prevent said element from protruding from said cavity and said second collar being rigidly coupled to the portion of said stem that lies inside said cavity, a tab passing through said wall and being shaped so as to have an intermediate flap or portion and an end flap which are guided on said stem inside said cavity and on opposite sides with respect to said second collar, said end flap of said tab being interposed between said second collar and said element, said intermediate flap being interposed between said second collar and said wall, a strip being rigidly coupled to said bolt, lying within said cavity and having a flap which is guided on said stem between said wall and said intermediate flap, a first expansion spring being arranged on said stem between said flap and said wall and a second expansion spring being arranged between said intermediate flap and said second collar, said tab being controlled by said retention means.
5. The device according to any one of claims 2 to 4, characterized in that said retention means are constituted by a lever which is pivoted in said seat and comprises a tooth which is suitable to abut against said slider or said tab in order to retain said bolt in the position for engaging said slot, said lever being manually actuable in contrast with the action of a spring into a position for disengaging said slider or said tab so as to produce the retraction of said bolt into said enclosure by means of the action of said spring.

6. The device according to claim 2, characterized in that said slider comprises a tab which extends into said seat and has a plurality of notches which can be engaged by said retention means in relation to the stroke of said bolt so as to lock said slider at a level that corresponds to said stroke.

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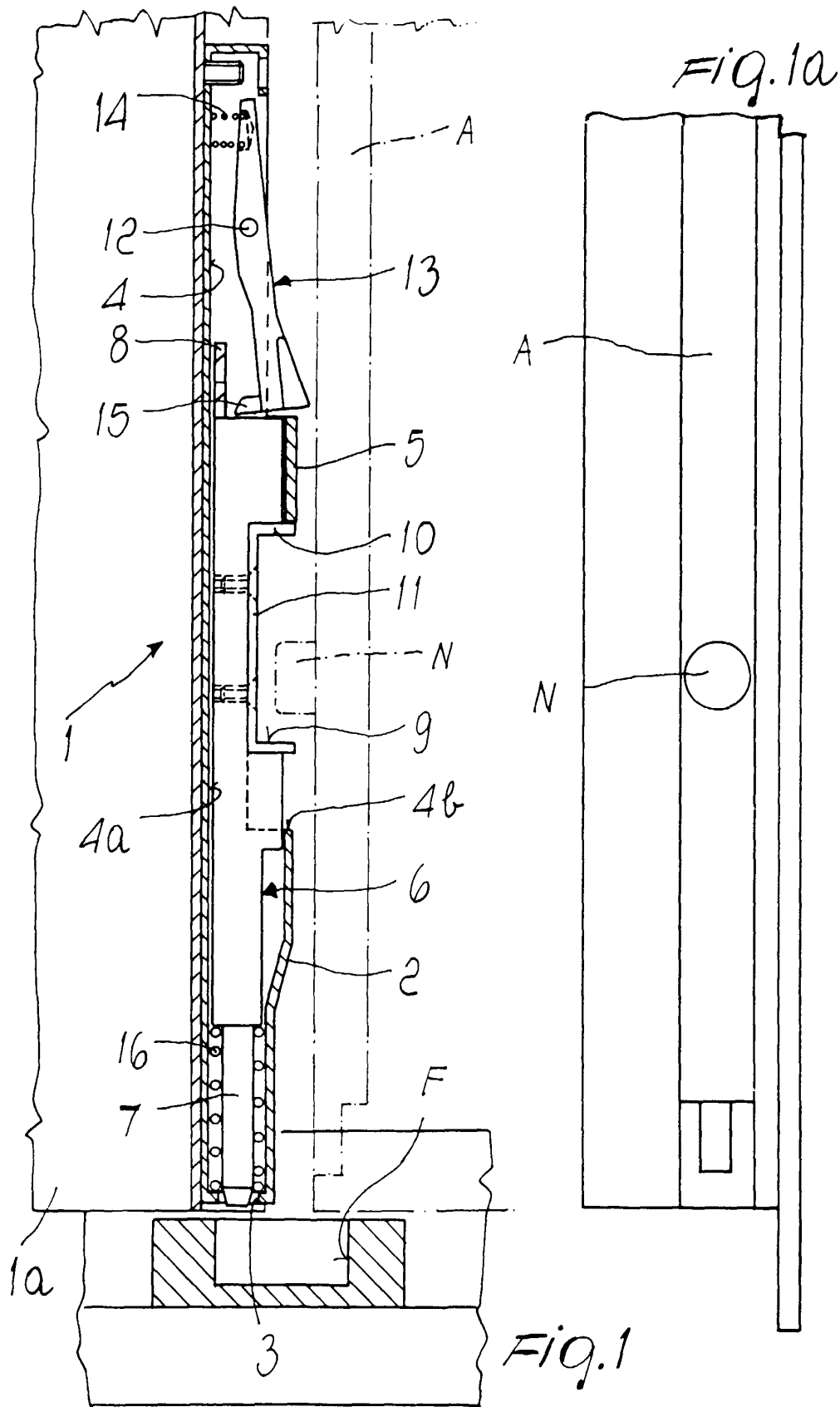
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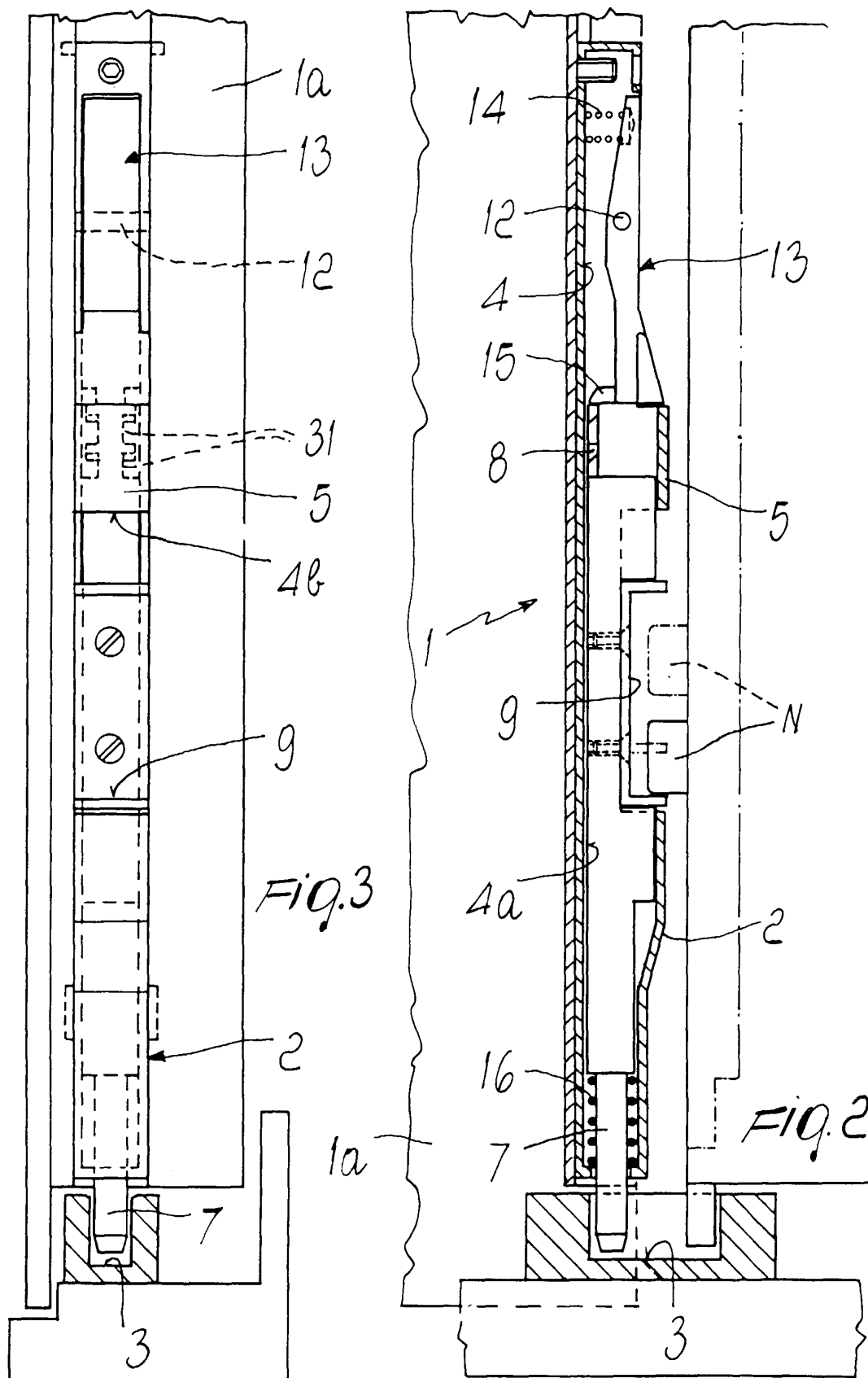


FIG. 4

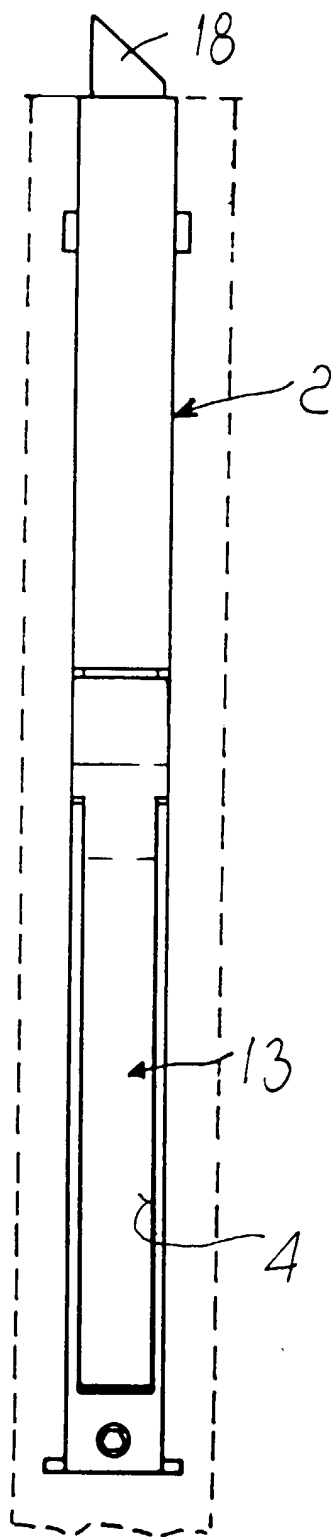


FIG. 5

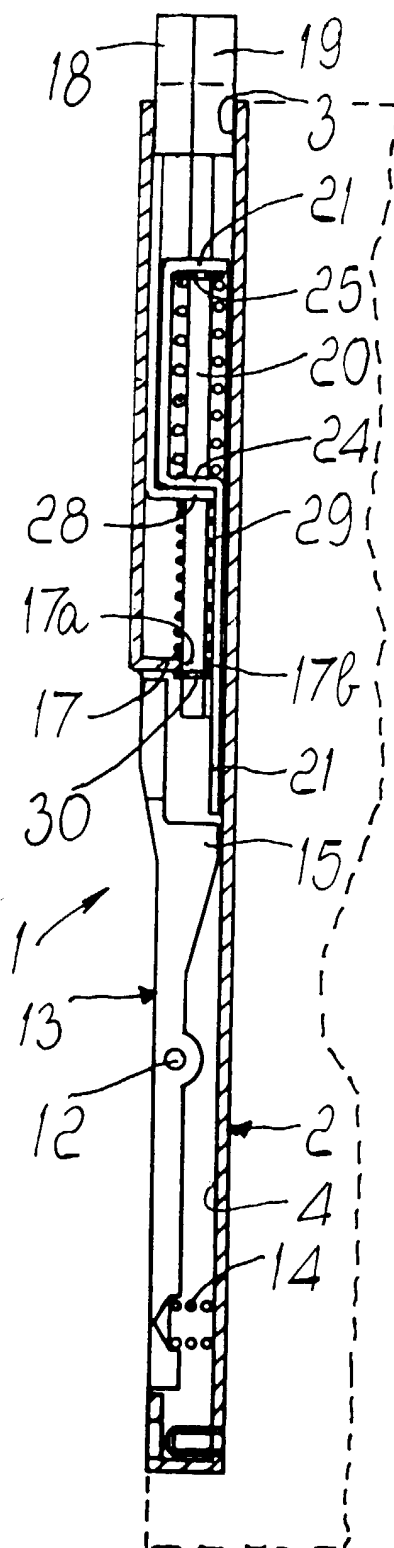


FIG. 6

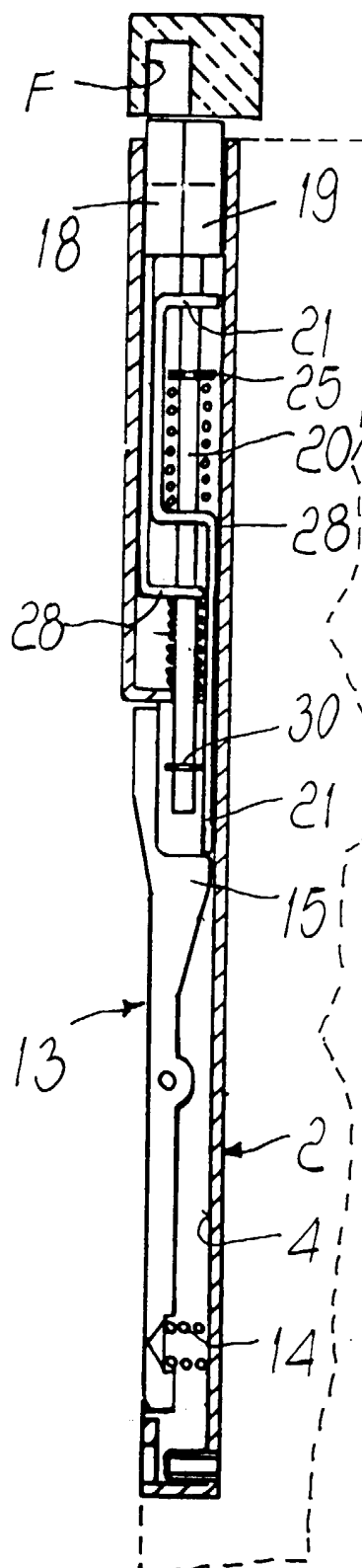


FIG. 7

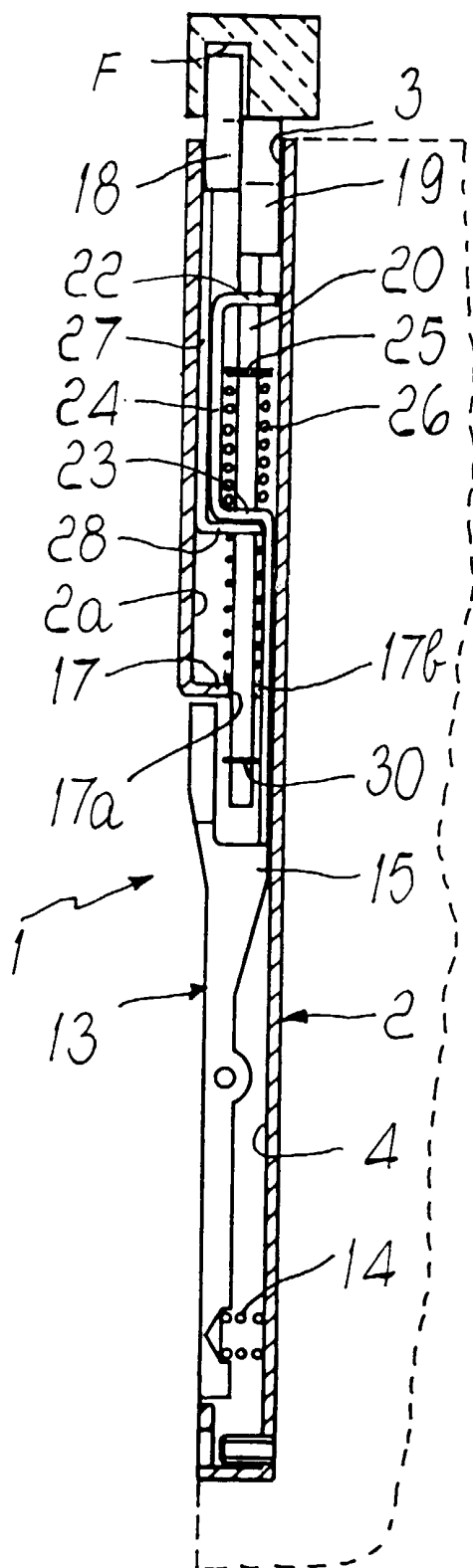
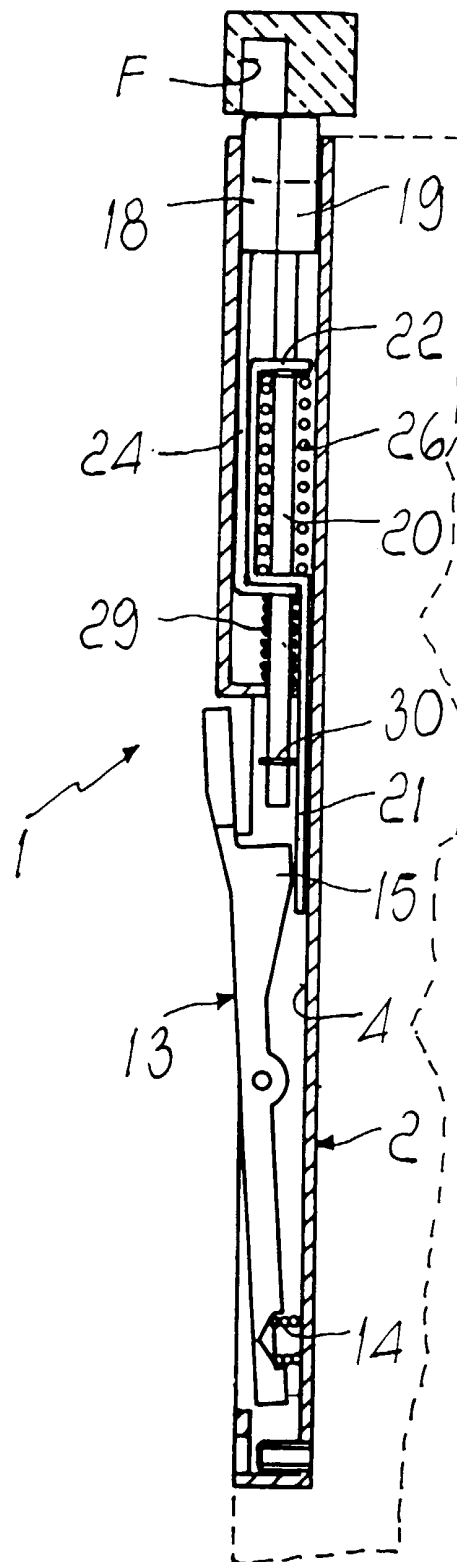


FIG. 8





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EUROPEAN SEARCH REPORT

Application Number
EP 99 11 8027

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.6)
X A	US 2 202 916 A (MUSSA) 4 June 1940 * column 1, line 39 - column 3, line 24; figures * ---	1,3 2,5	E05C7/04
X	EP 0 626 494 A (ALCAN FRANCE) 30 November 1994 * column 10, line 7 - column 11, line 26; figures 6A-6C * ---	1,3	
A	DE 31 42 959 A (SCOVILL SICHERHEITSEINRICHTUNGEN GMBH) 10 March 1983 * abstract; figures * ---	1,3	
A	EP 0 849 425 A (DORMA GMBH + CO. KG) 24 June 1998 * abstract; figures * -----	1,3	
The present search report has been drawn up for all claims			TECHNICAL FIELDS SEARCHED (Int.Cl.6)
			E05C
Place of search MUNICH		Date of completion of the search 16 November 1999	Examiner Vacca, R
<p>CATEGORY OF CITED DOCUMENTS</p> <p>X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document</p> <p>T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document</p>			

EPO FORM 1503 03/82 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 99 11 8027

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
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16-11-1999

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2202916 A	04-06-1940	NONE	
EP 626494 A	30-11-1994	FR 2705723 A	02-12-1994
		DE 69403734 D	17-07-1997
		DE 69403734 T	18-09-1997
		DK 626494 T	29-12-1997
		ES 2105543 T	16-10-1997
		GR 3024329 T	31-10-1997
DE 3142959 A	10-03-1983	AT 376000 B	25-09-1984
		AT 262882 A	15-02-1984
		CH 657417 A	29-08-1986
		NL 8202928 A	01-03-1983
EP 849425 A	24-06-1998	DE 19652601 C	25-06-1998